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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,610	10/02/2003	Srinivasan Chakravarthi	TI-33161.1	8944
23494	7590	03/09/2004	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			DANG, PHUC T	
			ART UNIT	PAPER NUMBER
			2818	
DATE MAILED: 03/09/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/677,610	CHAKRAVARTHI ET AL.	
	Examiner	Art Unit	
	PHUC T DANG	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8, 10, 11 and 13-15 is/are rejected.
- 7) ☒ Claim(s) 9, 12 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1003</u> | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. This application is a divisional of 10/020,813 filed on December 12, 2001.

Preliminary Amendment

2. In Preliminary Amendment filed on October 2, 2003, Applicants cancel claims 1-7 and 17-21 and claims 8-16 are still pending in the application.

Oath/Declaration

3. The oath/declaration filed on October 2, 2003 is acceptable.

Information Disclosure Statement

4. The office acknowledges receipt of the following items from the applicant:

Information Disclosure Statement (IDS) filed on October 2, 2003.

Drawings

5. The formal drawings filed on December 12, 2003 have been acknowledged.

Specification

6. The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary

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skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 8, 10-11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura (U.S. Patent No. 5,602,045) in view of Bensahel et al. (U.S. Patent No. 4,263,056).

Kimura discloses a method of doping a single crystal semiconductor substrate, comprising:

exposing a surface of the substrate to high energy particles to pre-amorphize a layer of the crystal adjacent the substrate; and

implanting the substrate with a temporary impurity atom;

heating the substrate to cause the crystal to re-grow within the layer adjacent the surface [col. 6, lines 43-59].

Kimura discloses all the features of the claimed invention as discussed above, but does not disclose the steps of forming a coating comprising a target dopant over the surface of the substrate either before, during, or after heating; and annealing to cause the target dopant to diffuse from the coating into the substrate.

Bensahel et al., however, disclose the steps of forming a coating comprising a target dopant over the surface of the substrate either before, during, or after heating; and annealing to cause the target dopant to diffuse from the coating into the substrate [col. 4, lines 49-54].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to apply the teaching of Bensahel et al. to Kimura discussed above such that the steps of forming a coating comprising a target dopant over the surface of the substrate either before, during, or after heating; and annealing to cause the target dopant to diffuse from the

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coating into the substrate for a purpose of improving the process of doping a single crystal semiconductor substrate.

Regarding claims 10-11, Kimura discloses the high energy particles comprise particles selected from the group consisting of Ge, In, Sb, Si and Ar and the temporary impurity atom is implanted with a dose of at least about 1×10^{14} atoms/cm² [col. 4, lines 36-39].

Regarding claims 13-15, Bensahel et al. disclose the chemical material, the location and the concentration of the target dopant used in the process of doping a single crystal semiconductor substrate [col. 3, lines 50-58].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to apply the teaching of Bensahel et al. to Kimura discussed above such that for a purpose of improving the process of doping a single crystal semiconductor substrate.

Allowable Subject Matter

8. Claims 9, 12 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuc T. Dang whose telephone number is (571) 272-1776. The examiner can normally be reached on 8:00 am-5:00 pm.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone numbers for the organization

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where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-872-9306 for After Final communications.

11. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Phuc T. Dang

PD

A handwritten signature in black ink, appearing to read 'Phuc T. Dang', with a long, sweeping horizontal stroke extending to the right.

Primary Examiner

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February 26, 2004